Space Weather Forecast

Issued on Wednesday, 19 January 2022 at 12:18 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of Minor Geomagnetic Storm and

Chance of isolated Moderate-class flare (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a Moderate class flare observed late on the 18th. A CME was observed and the bulk of this is likely to miss Earth. The common-class flare from one of the larger sunspots on 16 January produced a Coronal Mass Ejection (CME) directed mainly to the northwest of the Earth in the plane of its orbit. Four sunspot regions remain on the sun, with three bipolar and one weak uni-polar. AR2929 has been the most active as it approaches the northwest limb.

Solar Wind / Geomagnetic Activity: The solar wind was symptomatic of connection to a high speed stream from a large southern solar hemisphere coronal hole. The solar wind speed was elevated for much of the period, becoming strong (above 600 km/s) at times. The number of particles comprising the solar wind was near or slightly above average. The important northward / southwards direction remained mostly Weak. Geomagnetic activity was Quiet to Unsettled (Kp2-3) with a Moderate Geomagnetic Storm observed between 19/0000 UTC and 19/0300 UTC and a Minor Geomagnetic Storm observed in the following period. This probably resulting from a CME that departed the sun around the 15th.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be mostly Low and further Common-class flares are expected days 1 and 2 (19 and 20 Jan) each day with a chance of a further Moderate-class flare. The probabilities of flares decreasing from day 3 (21 Jan) as two of the sunspot regions rotate off the visible disc.

Solar Wind / Geomagnetic Activity: A CME from the common-class flare from 16 January may carry an Earth-directed component, with a possible glancing blow arriving early in the UTC day of Thursday 20 January. The CME from the M1.5 flare on 18 January has been analysed and this too may pass Earth as a glancing blow around Saturday 22 January. Geomagnetic activity will probably remain Quiet to Unsettled, with a slight chance of further minor geomagnetic storms. Solar winds are expected to decline (independent of the potential CMEs mentioned above).

Energetic Particles / Solar Radiation: The weight of sunspot groups and activity in the western solar hemisphere is leading to a raised risk of S1 in the coming four-day period, although the effect is currently considered to be slight.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	20	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	20	10	5
Very Active	R3 to R5 X	No	5	3	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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